

markable feature in the ceremony was the firing of a cannon as each candidate was promoted. The delegates were reminded of another Scandinavian land the King of which gave command to "let the kettle to the trumpet speak, the trumpet to the cannoneer without." In Upsala the trumpet and kettle-drum seemed to be replaced by the electric button.

The Doctors in Philosophy were promoted by Dr. Tycho Tullberg, a collateral descendant of Linnæus. The ceremony consisted in placing a gold ring on the finger and a "laurel crown" on the head of each candidate; in the case of the honorary doctors the crown was made of leaves from a bay tree planted by Linnæus. The British doctors were Mr. Carruthers, Mr. F. Darwin, Sir A. Geikie, and Mr. Daydon Jackson. Among the Swedish doctors was the deservedly popular Prince Eugen, who has made for himself a reputation as an admirable landscape painter.

In the evening there was a great banquet in the Aula of the University, and an evening entertainment given by the students.

On Saturday, May 25, the delegates departed for Stockholm, where the Linné Fest was continued by the Royal Swedish Academy under the auspices of Count Mörner, the president. Here again the delegates were met with excellent arrangements and a warm welcome. A solemn meeting of the academy was held at which the delegates presented addresses, speeches were made, and a cantata was sung, of which the words were by G. Retzius, the music by Valentin. To the general satisfaction of all the delegates, and to the especial delight of those from Britain, the Linnean gold medal of the academy was awarded to Sir Joseph Hooker, and handed to Sir Rennell Rodd, the British Ambassador, for transmission to England. A beautiful bronze medal given to each delegate forms a particularly attractive memento of a memorable occasion.

In the evening a great banquet was given, at which the speeches were made by the president of the academy (Count Mörner), the Crown Prince, Prince Roland Bonaparte, and the Prime Minister. Later in the evening the students gave an entertainment at Skansen, the beautiful zoological and ethnological garden of Stockholm.

One of the most striking features of the Fest was the interest shown in it by the Royal House. The Crown Prince and Princess and other members of the Royal Family were present at the meetings and banquets both at Upsala and Stockholm. The Crown Prince mingled with the guests with a kindness that was much appreciated by the delegates, and the same may be recorded of the other members of the Royal House. A garden-party given by the Crown Prince on Sunday was somewhat marred by the break-up of the fine weather which had added so much to the effect of the Upsala gathering.

Finally must be mentioned the generosity of the authorities of Upsala and Stockholm in presenting the delegates with a valuable reproduction of the portraits of Linnæus and a reprint of his works, including a facsimile of the first edition of the "*Systema Naturæ*."

#### CELEBRATION AT THE LINNEAN SOCIETY.

The reception held by the Linnean Society of London on Friday, June 7, as part of its celebration of the bicentenary of Linnæus was attended by nearly three hundred guests, many of whom were ladies. The Swedish Minister, some of the Swedish Legation, and several other Swedes were amongst those present. The president of the society, Prof. Herdman, F.R.S., and Mrs. Herdman, received the guests in the library, and prominent among the exhibits were many interesting personal relics of the great naturalist—selections from his herbarium, cases of Lepidoptera, Coleoptera, fishes, and shells, including the celebrated artificial pearls produced by the native fresh-water mussel.

The beautiful medallion by Inlander, which was copied by Josiah Wedgwood, occupied a conspicuous position, and was surrounded by a laurel wreath from the recent festival held at Upsala on May 23 and 24, which was lent by one of the British representatives who received an

honorary degree there. A large series of medals which had been struck at various times in honour of Linnæus also were set out in the same case; they included Count Tessin's medals of 1746 and 1758, Ljungberger's large medal, struck by command of Gustaf III. in 1778 on the death of Linnæus, and many of a later date. Recent medals were also shown, such as the Linnean medal of the society, a special copy of which had been presented to the Royal University of Upsala last month, and, latest of all, a bronze copy of the bicentenary medal, struck for the Royal Swedish Academy of Sciences, and awarded on May 25 to Sir Joseph Hooker, G.C.S.I., F.R.S. Two cases contained the correspondence between Linnæus and our own countryman, John Ellis, F.R.S., the letters on both sides being shown; manuscripts of great interest, copies of books interleaved and copiously annotated by Linnæus, his Lapland diary, and his note-book for the eventful year which witnessed his departure from Sweden to take his medical degree at Harderwijk, and the issue of his "*Systema Naturæ*" in 1735. The foregoing were shown by the Linnean Society, in whose possession they have been since the death of Sir J. E. Smith, the first president, in 1828.

Dr. Tempest Anderson displayed photographs showing the growth of vegetation in St. Vincent since the volcanic eruption in 1902; Prof. Dendy, preparations from his New Zealand specimens; Mr. A. D. Darbishire, Mendelian phenomena; Miss Benson and Prof. F. W. Oliver, the spermatozoid bodies in the fossil seeds of *Lagenostoma* and *Physostoma*; Prof. Farmer, apogamic growths from fern-prothallia; and the president, specimens of pearl oysters and plankton gatherings taken during the present spring. Animated photographs of plant-life were shown by Mrs. D. H. Scott, and many other objects of great interest were on view in the library and the galleries.

During the evening a series of short lectures was given in the meeting room by the following:—Prof. Poulton, Prof. Herdman (who prefaced his remarks by a short discourse on the present Linnean celebration), Lieut-Colonel Prain, and Mr. F. J. Lewis. The rooms were not deserted until nearly midnight.

#### THE ROYAL OBSERVATORY, GREENWICH.

THE report of the Astronomer Royal to the Board of Visitors, on the work done at the Royal Observatory during the period May 17, 1906, to May 10, 1907, was presented on Saturday, June 8, when the annual visitation took place. A brief summary of this report is given below.

In addition to the routine observations, the transit-circle was employed on a number of stars, of the ninth magnitude and brighter, which may be used as reference stars for the Oxford astrographic zones; 7704 transits were taken during the year.

The second nine-year catalogue (epoch 1900) will probably be ready for press before the end of the current year, and will be divided into two parts, (1) fundamental and zodiacal stars, (2) astrographic reference stars.

The reflecting prism for illuminating the field of the altazimuth has been replaced by a smoothly ground reflector of opal glass, cemented on to the object-glass, and this gives a much more uniform illumination. The observations of the moon and of the lunar crater Mösting A were continued, and, discussed with the similar observations carried out at the Cape Observatory, should give an improved value for the lunar parallax.

The new working list for the 28-inch refractor primarily includes double stars discovered by Hough, and during the year 400 pairs were observed, fifty-eight of them having a separation of less than 0".5. The equatorial and polar diameters of Jupiter were measured by the methods described in the previous report, these measures being intended to supplement those made during the opposition of 1895-6. The diameters of the satellites were also measured on two nights with the filar micrometer.

When the 30-inch mirror on the Thompson equatorial was taken out for re-silvering, in November, 1906, it was found to be slightly loose in its cell, so, before re-mounting,

twelve wedges of *lignum vitæ* were inserted symmetrically round the mirror, and appear to have eliminated the slight movement.

Fifty-five photographs of the sixth, and eleven photographs of the seventh, satellite of Jupiter were secured with the 30-inch reflector, together with 170 photographs of minor planets and comets and twelve of various nebulae. Of the latter, that of M 31 (Andromeda) and one of the Ring Nebula in Lyra are especially good.

The discussion of the photographs of Eros taken during the opposition of 1900-1 was completed, and a value for the solar parallax, in close agreement with the previously accepted value, was deduced.

With the astrographic telescope 188 supplementary photographs were taken, and 133 of them were passed as satisfactory. Positive copies of the plates covering zones  $71^{\circ}$ – $74^{\circ}$  are now completed, and of the 461 chart plates necessary to cover the remaining zones,  $75^{\circ}$  to the pole, seventy-five have to be repeated for the purpose of reproduction. Vol. ii. of the Greenwich Astrographic Catalogue is now complete, except for the introduction, which will contain the constants for the plates, and these have now been computed. For the area included in zone  $81^{\circ}$  (from  $6h$ . to  $24h$ .) and the zones  $82^{\circ}$  to the pole, viz.  $254.7$  square degrees, the 40m. exposure plates show 75,683 star images, or 297.2 per square degree; in the B.D. the corresponding area ( $1^{\circ}$ ) includes 15.7 stars. About 13,000 enlarged prints of the chart plates were made during the year.

During the period covered by the report, the sun was photographed on 210 days, and for 1906, including the Indian and Mauritian negatives, the daily photographic record of the sun's surface was complete except for one day. Twenty-three photographs of portions of the solar disc were secured with the 26-inch photographic refractor, fitted with a negative enlarger, the scale being such as to give a solar diameter of 30 inches.

The magnetic observations were carried on as usual, the principal results for the magnetic elements for 1906 being

Mean declination ... ..  $16^{\circ} 3' 6''$  W.  
Mean horizontal force ... ..  $4.0174$  (in British units)  
... ..  $1.8524$  (in metric ,, )  
Mean dip (with 3-inch needles)  $66^{\circ} 55' 17''$

There were no days of "great" magnetic disturbance and eight of lesser disturbance.

The mean temperature for the year ending April 30, 1907, was  $50^{\circ}.5$ , or  $0^{\circ}.9$  above the average for 1841–1905, the highest and lowest shade temperatures recorded being  $94^{\circ}.3$  (August 31) and  $10^{\circ}.8$  (December 30) respectively. Of the 4457 hours that the sun was above the horizon at Greenwich, the Campbell-Stokes instrument recorded 1687 hours of bright sunshine.

The total rainfall was 0.26 inch below the average for the sixty-five years 1841–1905, being 23.86 inches, whilst the number of "rainy days" was 148.

The performance of the chronometers sent in for the annual trial was hardly up to the high standard of recent years, and of the fourteen pocket-chronometers submitted none came up to the standard of purchase. The next trial for chronometers will commence on June 15, and for chronometer watches on August 3.

In concluding his report, the Astronomer Royal refers to the threatened danger to the astronomical efficiency of the observatory occasioned by the L.C.C. generating station near by, the principal point being the recommendation of the committee appointed to consider the matter, that the conditions be reviewed after the lapse of two years. Experiments made last summer showed that the vibrations from the present installation can be effectually damped out by keeping the film of mercury in the amalgamated trough as thin as possible, but there still remains the danger that these vibrations may so cause the large telescopes to oscillate that delicate observations, such as close double-star work, may suffer materially.

A more insidious danger is that the heated gases from the chimneys may affect the accuracy of star observations on the northern meridian, and in that case the errors would not be discovered until the observations were reduced, when, possibly, it would be impracticable to repeat the observations.

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## TWO HEAVY SEISMOGRAPHS.

TWO new seismographs devised by Dr. Wiechert are now on sale by Spindler and Hoyer, of Göttingen. The fact which will strike most seismologists is the magnitude of the "stationary" mass employed. The horizontal pendulum uses a "stationary" mass of 17,000 kilo., nearly 17 tons. The mass is composed of barytes contained in a cylindrical sheet-iron vessel with a flat bottom. Its dimensions are 2 metres in diameter by nearly 2 metres in height, and, being intended to have freedom of movement horizontally, the vessel is suspended by three iron rods of 3 cm. diameter, the elasticity of which allows the necessary freedom. The next striking feature is the multiplication with which the thrust arm moves the indicator point, and this is 2200! It is brought about by means of four levers, multiplying  $5 \times 5 \times 5 \times 17\frac{1}{2}$ . The loss owing to the inertia and elasticity of the connecting system amounts to 5 per cent. only. "The instrument renders specially important service in the small European earthquakes where the rapid oscillations are more prominent." It is clear that this statement is justified. For local disturbances and extremely rapid elastic vibrations the instrument should be of great service, but, with such a multiplication, one is compelled to wonder how much the machine requires to be isolated in order to avoid the disturbance due to traffic. It is not surprising to find in a specimen seismogram tremors due to a gas engine  $2\frac{1}{2}$  kilometres distant. Other drawbacks to the use of the pendulum are the price, 5000 marks, and the number of times the paper must require to be changed. These purely practical considerations must have weight with anyone who has real work in view.

The vertical seismograph has a "stationary" mass of 1300 kilograms, about one and a third tons. Even this is great as compared with the usual one to two hundred pounds. The multiplication, 160, is also large when one thinks of the usual 12 to 20. "The vertical apparatus often indicates the first movements of very distant earthquakes better than even the 17,000 kilo. pendulum, which multiplies 2000 times; so the Schlüter result is confirmed, from which follows that in the case of first indications we have to do with longitudinal movements." Thus runs the prospectus. The price of this pendulum, too, 2800 marks, is rather prohibitive, although the workmanship in both leaves little to be desired.

## UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Dr. Graham-Smith, Prof. Nuttall, and Prof. Woodhead have been nominated to represent the University at the International Congress of Hygiene and Demography to be held in Berlin in September.

The general board of studies has approved Alexander Scott for the degree of Doctor in Science.

Profs. E. H. Living and H. Louis have been nominated examiners in the application of science to the art of mining, and Mr. C. T. Heycock an examiner in metallurgy for the diploma in mining engineering for the examination to be held in the Michaelmas term, 1907.

The Balfour studentship will be vacant at Michaelmas next. The names of applicants, together with such information as they may think desirable, should be sent on or before October 1 to the secretary, J. W. Clark, Registry of the University, Cambridge. The studentship is of the net annual value of 200l., or such larger sum as the University may from time to time determine. The student need not be a member of the University, and during his tenure of the studentship is required to devote himself to original biological inquiry.

The Vice-Chancellor announces that the advisory committee of the Colonial Office for the tropical diseases research fund recommends that a grant of 100l. for two years should be made from the fund to assist in establishing a research studentship in medical entomology in Cambridge, and that Lord Elgin is prepared to approve of the proposal. Candidates for the studentship are requested to send in their applications to Prof. Nuttall, 3 Cranmer Road, Cambridge, on or before Monday, June 17.